WE CLAIM:

1. A method for distinguishing concentrations of blood constituents among distinct vascular components in situ, the method comprising:
    a. inducing periodic vibration, characterized by a frequency, in a limb of a person in such as manner as to selectively excite a resonant response in a a specified blood vessel of the person;
    b. illuminating the limb of the person with a light source;
    c. detecting light from the light source that has traversed the specified blood vessel and generating a plethysmographic signal corresponding thereto; and
    d. synchronously detecting the plethysmographic signal for discriminating response attributable to the specified blood vessel.
2. A method in accordance with claim 1, wherein the specified blood vessel is a vein.
3. A method in accordance with claim 1, further including the step of separately monitoring the plethysmographic signal attributable to the specified blood vessel and a plethysmographic signal attributable to second specified blood vessel.
4. A method in accordance with either of claims 1 or 3, wherein the step of illuminating the limb includes illuminating with two wavelengths of light.
5. A method in accordance with claim 4, further including the step of ratioing light detected at each of the two wavelengths of light in order to derive oxygen saturation of blood in the vein.
6. A method in accordance with claim 1, wherein the step of inducing vibration in the limb includes modulating air pressure applied to at least one inflatable pad enveloping the limb at least in part.
7. An apparatus for inducing plethysmographic response due to blood in a specified blood vessel of a person, the apparatus comprising:
    a. a vibrator for inducing periodic vibration, characterized by a frequency, in a limb of a person in such as manner as to selectively excite a resonant response in the specified blood vessel of the person;
    b. a light source for illuminating the limb of the person;

c. a detector for detecting light from the light source that has traversed the specified blood vessel and for generating a plethysmographic signal corresponding thereto; and

d. a signal processor for synchronously detecting the plethysmographic signal and for discriminating response attributable to the specified blood vessel.

8. An apparatus in accordance with claim 7, wherein the vibrator is a mechanical perturber.

9. An apparatus in accordance with claim 7, wherein the vibrator is a fluidic perturber.